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7/30/93

PRELIMINARY DRAFT
FOR REVIEW AND DISCUSSION
7/30 SUBJECT TO CHANGE

July 30, 1993

Via Federal Express

Mr. Joseph Klinger
Head of Licensing
Division of Radioactive Materials
Illinois Department of Nuclear Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Re: Classification of Radioactive Material Located at:
316 East Illinois Street
Chicago, Illinois
Chicago Dock and Canal Trust Property

Dear Mr. Klinger:

As we have discussed, we represent the Chicago Dock and Canal Trust ("Chicago Dock") which owns and manages the Cityfront Center Complex in downtown Chicago including the 316 East Illinois Street property ("the property") located within the Cityfront Center area. Since 1933, the property has been undeveloped and unoccupied, and for the last several years has been an asphalt paved parking lot operated by the General Parking Company.

As you know, the property has been the subject of a recent joint investigation by the United States Environmental Protection Agency ("USEPA") and your agency, the Illinois Department of Nuclear Safety ("IDNS"). That investigation, included measurements taken June 1, 1993, which apparently indicated the presence of

radioactivity at discrete locations on the property at levels above natural background. Subsequently, in a June 21, 1993 letter, USEPA requested IDNS to classify the radioactive material at the property to assist USEPA in developing appropriate removal and disposal options.

We have suggested, and you have agreed, that additional historic information about the property and an analysis of the applicable legal standards for waste classification, would aid your consideration of the classification issue. We have, reviewed Chicago Dock's historical records, as well as other available information, in an effort to reconstruct the Lindsay Light Company's ("Lindsay's") prior use of the property. Based on that review, when considered in light of the relevant regulations and case law, the radioactive material should be classified as either "source" or "NORM" as defined in the Illinois and Federal regulations. The following discussion sets forth our investigation and review of this issue, including the factual and legal justification for classification of the material as "Source" or "NORM".

I. BACKGROUND

Chicago Dock is a real estate investment trust formed in 1962. It is the direct successor to the Chicago Dock and Canal Company, which was founded in 1857 by Chicago's first Mayor, William Ogden, and was the original owner of a major portion of the Cityfront Center site. Cityfront Center consists of 60 acres in downtown Chicago. Chicago Dock is currently developing 40 acres

bounded by Columbus Drive on the West, Grand Avenue on the North, the Chicago River on the south and Lake Shore Drive on the east. The 316 Illinois Street property is located within this area. Our records indicate that the property has been vacant since 1933 when the building at 316 E. Illinois was demolished. Prior to the apparent discovery of the radioactive material at the property, Chicago Dock intended to develop the property as part of the master plan for Cityfront Center. Those plans are now on hold pending resolution of the apparent presence of radioactive materials.

A. USEPA Investigation and Testing

In early June, 1993, Chicago Dock was contacted by USEPA regarding suspected historical operations on the property by Lindsay. This investigation apparently arose from USEPA's ongoing involvement with Kerr-McGee Company's Rare Earth Facility in West Chicago, Illinois. Lindsay was a predecessor company to Kerr-McGee in West Chicago and left a well publicized and much litigated legacy of radioactive contamination from prior manufacturing and ore processing activities in West Chicago. USEPA believed that Lindsay had once occupied the property in the early 1900's in connection with Lindsay's manufacture of incandescent gas mantles. As will be discussed later in more detail, radioactive thorium nitrate was used as part of this manufacturing process.

USEPA requested access to the property for a site screening to detect potential gamma radiation from the suspected radioactive contamination below the asphalt paved surface. In that screening, USEPA found elevated gamma readings in a discrete area along the

south-central margin of the site fronting Illinois Street, measuring approximately 90 feet E-W by 100 feet N-S. The highest reading in one spot was 280 microroentgen per hour (280 micro R/hr), within an area where the readings ranged from background (15 to 30 microR/hr) to 150 microR/hr. Dosage measurements were also taken and maximum levels were measured at .27 millirem per hour (.27 mRem/hr.) at the point of the highest gamma readings. In that a dosage level of 2 mRem/hr is allowed for unrestricted access areas (which is a level ten times the levels measured by USEPA on the property) USEPA advised Chicago Dock that based on the current state and usage of the property, the parking lot could remain open as it did not pose an immediate threat to human health or the environment. USEPA has recently issued a draft Administrative Order by Consent ("AOC") to Chicago Dock, designed to address further investigation and sampling at the property. Discussions with USEPA regarding that order are ongoing. Chicago Dock intends to cooperate fully with USEPA to devise a plan for the appropriate investigation and potential remediation of the site.

B. Chicago Dock Investigation

Once Chicago Dock learned of Lindsay's potential prior occupancy of the property, and the elevated gamma readings, it took several steps. First, although USEPA assured the Company that there was no danger, nonetheless Chicago Dock chose to inform the public, nearby tenants and potential lot patrons and employees, of the existence of the elevated gamma readings. This notification occurred through a press release, a public meeting with nearby

apartment tenants, and posted written as well as verbal notification to parking lot attendants (who man booths on the lot) and parking lot patrons. Next, Chicago Dock investigated the nature and extent of Lindsay's operations in downtown Chicago in the early 1900's. USEPA advised Chicago Dock that elevated gamma readings have also been detected in the 161 East Grand building, in some cases 10 to 20 times higher than the readings found on the Chicago Dock property. Therefore, Chicago Dock researched not only Chicago Dock's property at 316 East Illinois, but also the ownership and use of Lindsay's prior corporate headquarters and manufacturing facility located at 161 East Grand Avenue, Chicago, Illinois.[1]

The investigation reviewed Chicago Dock's own records, as well as publicly available information. The investigation focused on Lindsay's historical operations and use of the property at 161 East Grand, and 316 East Illinois, in an attempt to determine the nature of the radioactivity and understand how the material was generated and apparently deposited on Chicago Dock's property.

II. HISTORICAL INVESTIGATION

A. Chicago Dock Records

Chicago Dock's books and ledgers date back to the late 1800's and consist of handwritten notations for rent receipts, taxes, improvements and other entries relating to Chicago Dock's

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[1] Chicago Dock has never owned or occupied the 161 East Grand Building. The historical investigation did not track the occupancy at 161 East Grand after Lindsay vacated the building in 1936. However, an advertising agency apparently now occupies the 4-story building.

real estate. The ledger entries indicate that prior to 1913, 316-322 East Illinois Street was occupied by Cooper's Stable. The building was a 2-story brick structure used to keep horses and wagons, as well as a blacksmith shop.

The Chicago Dock ledgers show that in 1914 Coopers Stable was divided in half, at the middle from east to west. Therefore, after 1914, two buildings were on the parcel -- one to the south fronting East Illinois at 316-322 and the other to the north fronting East Indiana. The ledgers indicate that Cooper's Stable still paid rent and occupied the north building fronting Indiana (Grand). The south portion, consisting of a warehouse like building of approximately 50 x 90 feet, was leased by Lindsay. Chicago Dock's ledgers confirm this development, as Lindsay begins making semi-regular rent and tax payments as a tenant of Chicago Dock at this time. The ledgers also identify Lindsay as a tenant of 316 East Illinois through Lindsay's payment of taxes for the south parcel. Chicago Dock collected rent from Lindsay from 1915 to 1932 -- the time period which we believe Lindsay leased the 316 East Illinois building. Finally, the ledgers indicate that the 316 East Illinois building was demolished in approximately 1933, which is consistent with the cessation of rent payments by Lindsay to Chicago Dock.

B. Publicly Available Records

A review of the publicly available historical records confirms that Lindsay occupied Chicago Dock's 316 East Illinois property, and provides a better understanding of Lindsay's operations at 161 East Grand, as well as Lindsay's use of 316 East Illinois.

i. Location of Lindsay in Chicago

The Lindsay Light Company was incorporated in Illinois on May 31, 1904. The Lakeside Directory of Chicago lists Lindsay at 195-197 Michigan Street (now Hubbard Street) from 1904 to 1907. A 1906 Sanborn map also identifies Lindsay at that location and describes its operations as "Manufacturer of Gas Mantles". In 1908, Lindsay moved to the 161 East Grand building, which was built for and owned by Lindsay. Lindsay remained in that building until 1936 when Lindsay moved its operations to West Chicago. All historical or telephone and manufacturing directories between 1908 and 1936, list the 161 East Grand address as the corporate headquarters and manufacturing plant for Lindsay. In only one instance, the Directory of Illinois Manufacturers, 2nd edition 1924-25, is Lindsay listed as occupying the 316 East Illinois Street address, although there is no description of any operations at that site.

ii. Lindsay's manufacturing operations -- mantle production

In the years prior to World War I, Lindsay appears to have been engaged solely in the manufacture of incandescent gas mantles, in which Lindsay imported the thorium nitrate used in the process either from Germany or the Welsbach Company which manufactured thorium nitrate in Glouster, New Jersey. A 1906 Sanborn map, revised in 1911, details Lindsay's operations at 161 E. Grand as "Manufacturer of Gas Mantles" and describes the locations of those operations in that 4-story building as follows:

"Basement:	Collodium Mixing and Laundry B.
1st Floor:	Office and Shipping
2nd Floor:	Tube Factory
3rd Floor:	Knitting and Labelling
4th Floor:	Dipping and Shaping"

A United States Tariff Commission document on the Incandescent Gas-Mantle Industry, published in 1920, describes the manufacturing process in detail. The fabrics used in the manufacture of mantles were cotton, ramie and artificial silk (collodion). Artificial silk was used because its ash had greater elasticity and did not require washing before impregnation. The fiber was woven to form a hose or tube, was bleached in an acid bath and then thoroughly washed in distilled water. After drying with hot air, the fabric was dipped into a 25-50% solution of thorium and cerium nitrates, in a proportion of 99 parts thorium nitrate to 1 part cerium nitrate. The fabric was then cut into appropriate lengths and one end sewn closed with asbestos thread. The mantle was then "fixed" by treating those portions of the mantle subject to the greatest strain with a thorium solution, containing alumina and alkaline earths. The mantle was then labelled with the manufacturer's trade-mark, dried and shaped. The mantles were inspected and then dipped into a collodion solution for strength during shipping.[2]

iii. Thorium nitrate production

At the beginning of World War I, the German supply of thorium nitrate was cut-off to American, European and British manufacturers

[2] Collodion (also collodium) is defined as a highly flammable colorless or yellowish syrupy solution, usually a mixture of alcohol and ether or sometimes some other solvent, used chiefly as a coating for wounds and for photographic films and plates and as a membrane in various chemical separation processes.

of gas mantles that imported thorium nitrate for use in the manufacturing process. It was during this 1916-1919 time period that many U.S. Companies, including Lindsay, began manufacturing thorium nitrate from monazite sands for sale to U.S. mantle manufacturers as well as for export to Canadian, European and British gas mantle manufacturers. It was at this time, too, that Lindsay began importing monazite sands, mainly from Brazil and India, as the raw ore from which the thorium was extracted.

The historical documents support these conclusions. The previously noted 1920 U.S. Tariff document explains:

> "When the European war broke out, English and French mantle makers, who had largely relied on German and Austrian sources of thorium nitrate, were cut off from these sources of supply and immediately turned to the American producers. The companies in the United States expanded their productive capacity to meet this foreign demand and the shortage caused in this country by the decreased imports of thorium nitrate. The Lindsay Light Company of Chicago, took up the manufacture on a considerable scale in 1914. Other producers are the Maywood Chemical Works, of Maywood, N.J., the Block Light Company of Youngstown, Ohio; and the General Gas Mantle Company of Camden, N.J. The Standard Tungsten Corporation, of New York, and the New Process Gas Mantle Company of Philadelphia, formerly manufactured some thorium nitrate."

In addition, from 1917 to 1919, Lindsay filed four patents for procedures to recover thorium from monazite sands. Also, the 1919 Moody's Analysis of Investments for Industrials, as well as a certified copy of a change in Charter filed by Lindsay on February 13, 1919, show that Lindsay amended its charter to allow the company:

> "To make, sell and deal in or with chemicals, chemical compounds, and chemical products and by-products of all kinds, organic and inorganic; to recover, obtain treat and refine, and deal in or with all kinds of metals and minerals and the products and processes and methods for making and compounding chemicals and chemical products and by-products and to treat

all kinds of metals and minerals and their products and by-products, to own, lease and deal in or with patents and other exclusive rights and privileges pertaining to chemicals, minerals, metals and other products and articles of manufacture, and to do a general manufacturing business."

Moreover, Lindsay is listed in a number of Illinois Manufacturing Directories after 1920 as a manufacturer of "gas mantles, thorium nitrate, cerium and rare earth chemicals". Finally, in the 1931 Moody's Manual of Investments, Lindsay is listed as having "entered into an agreement with European refiners to sell rare earth chemicals only in the American and Canadian markets, leaving the Continental market to European refiners." In 1935, Lindsay changed its name to Lindsay Light and Chemical Company, and the 1936 Moody's Manual of Investments provides that "during 1936, manufacturing activities were moved to the West Chicago, Illinois plant and the old Chicago plant was discontinued."

iv. Operations at 161 E. Grand versus Occupancy of 316 E. Illinois

We believe that the thorium extraction process was performed at the 161 East Grand facility, with 316 East Illinois being used as a warehouse or stable for temporary storage or shipping of raw material (including monazite sands), finished products (including thorium nitrate and finished gas mantles), and horses and wagons for transportation. In addition, sometime between 1915 and 1927, a railroad spur was installed between the then divided 316 East Illinois building and the building to the north, which could have provided another means of transportation of finished product from Lindsay's leased warehouse at 316 East Illinois to the market.